

PV-ezRack SolarTerrace II-A Installation Guide



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1. Introduction

Clenergy PV-ezRack® SolarTerrace II-A™ is a pre-assembled ground mount system suitable for large scale commercial and utility scale installations. PV-ezRack SolarTerrace II-A has been developed to fit any PV module. The innovative and patented SolarTerrace II-A T-Rails simplify and improve the accuracy of the installation. SolarTerrace II-A uses high quality engineered components, saving developers and installers time and money when delivering ground mount projects.











Please review this instruction guide thoroughly before installing PV-ezRack SolarTerrace II-A. This manual provides the supporting documentation for building permit applications relating to PV-ezRack SolarTerrace II-A Universal PV Mounting System.

The PV-ezRack SolarTerrace II-A components, when installed in accordance with this guide, will be structurally adequate and will meet the AS/NZS1170.2:2011 Amdt. 3-2012 standard. During installation and especially when working on the ground, you will need to comply with the appropriate occupational health and safety regulations. Please also check other regulations relevant to your local region. Make sure that you are using the latest version of the installation instruction guide, which you can do by contacting Clenergy by email on sales@clenergy.com.au, or contacting your local distributor.

The installer is solely responsible for:

- Complying with all applicable local or national building codes, including any that may supersede this manual;
- Ensuring that ezRack and other products are appropriate for the particular installation and the installation environment;
- Using only ezRack parts and installer-supplied parts as specified by ezRack (substitution of parts may void the warranty and invalidate the letter of certification);
- Ensuring that the ground condition are suitable;
- How to recycle: according to the local relative statute.
- How to disassemble: reverse installation process.
- Ensure that there are no less than two professionals working on the panel installation.
- Ensure the installation of the electrical equipment is performed by a professional and accredited electrician.
- Ensuring safe installation of all electrical aspects of the PV array, including providing adequate earth bonding of the PV array and PV-ezRack® SolarTerrace II-A™ components as required in AS/NZS 5033-2014 ADMT 2 2-2018.

2. Tools and components

			
<p>Allen key 6mm (M8 Hexagon Socket Screw)</p>	<p>Electric Drill (ST4.8 x16 self-tapping screw & M8 Hexagon Socket Screw)</p>	<p>Torque Wrench</p>	<p>Socket wrench with 19 mm socket</p>
			
<p>Measuring Tape</p>	<p>String</p>	<p>Marker Pen</p>	<p>Wrench</p>
			
<p>Electronic total station (optional)</p>	<p>Hydraulic driver</p>		

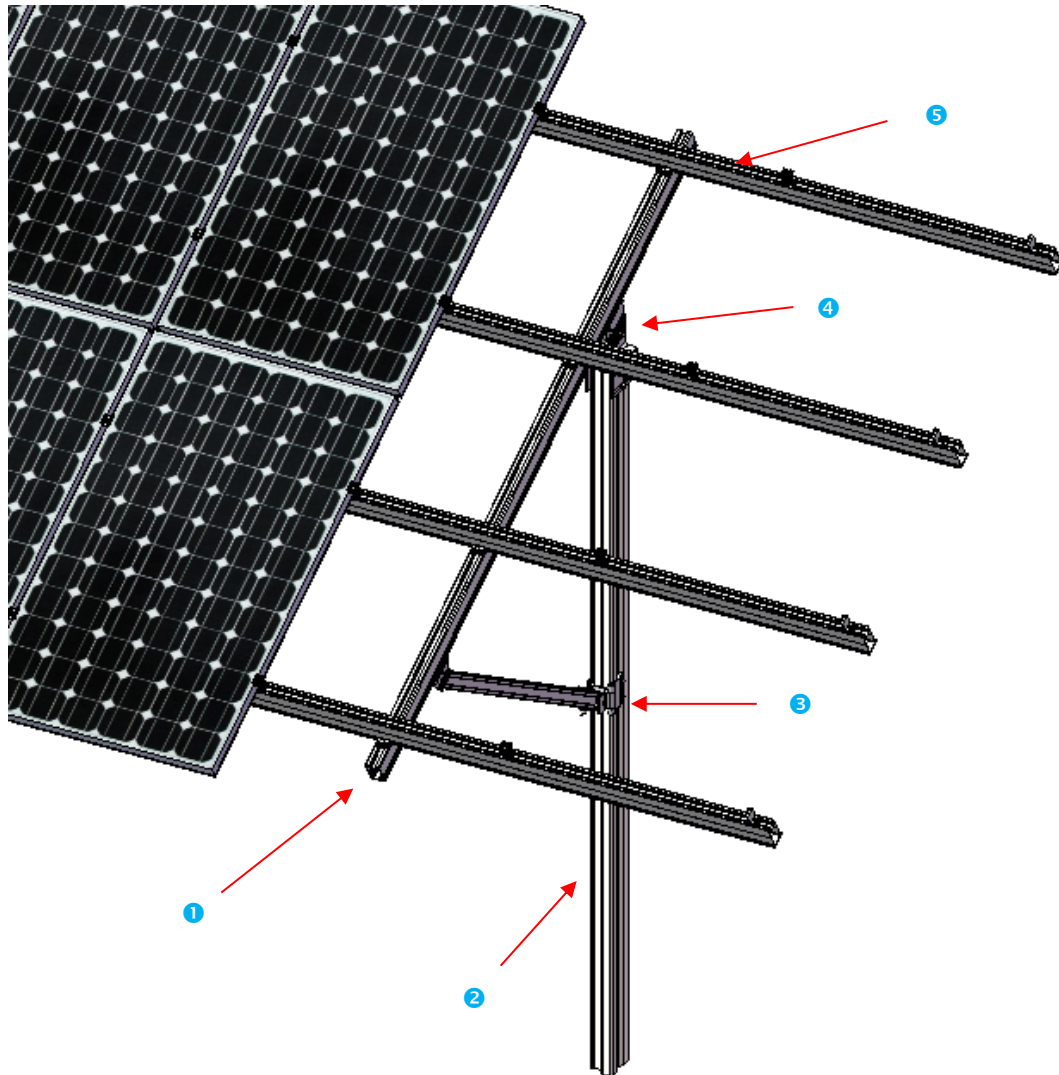
3. System overview

a. Components list

Components			
			
ER-EC-ST End clamp	ER-IC-ST/U18 Inter clamp U18 or ER-IC-ST	ER-R-T110 T-Rail 110	ER-RC-T Rail clamp for T-Rail
			
ER-S-STIIA/S Support(pre-assembled)	ER-PH-CP/A Post head for C-Post	ER-CP-2400/A C-Post	ER-PB-CP/A post brace for C-Post
			
ER-SP-T110 Rail splice	ER-PB-CP/D/A Post brace for C-Post on double support	ER-S-STIIA/D Double support(pre- assembled)	ER-RC-T/A Preassembled Rail clamp for T-Rail 105

Note: ER-PB-CP/D/A and ER-S-STIIA/D only used on STII double support mounting systems.

b. Overview



- ❶ STII-A, Support(pre-assembled)/ Double support(pre-assembled)
- ❷ STII-A, C-Post
- ❸ STII-A, Post brace for C-Post/Post brace for C-Post On double support
- ❹ STII-A, Post head for C-Post
- ❺ T-Rail 110

3.1 Installation in brief

Step 1: C-Post piling



Step 2: Post brace and head installation



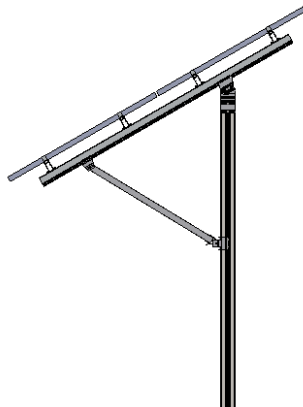
Step 3: Pre-assembled support installation



Step 4: T-Rail 110 installation



Step 5: PV modules installation



Note: See steps below before beginning double support installation. It is similar to the single support systems.

3.2 Installation Spacing



Max Frame Spacing and Footing Options of Panel Dimensions 1.7m x 1m

	Wind Region, tilt			
	Region A, 30° tilt	Region B, 30° tilt	Region C, 20° tilt	Region D, 20° tilt
Wind speed (m/s)	43	52	64	80
Clearance calculated, m	0.48	0.48	0.87	0.87
Maximum spacing* (m)	3.20	2.60	2.70	1.70
Max Vertical Reaction Downward, kN	13	15	19	18
Max Vertical Uplift Reaction, kN	13	16	17	18
Max Horizontal Reaction, kN	8	11	8	8
Max Moment at GL, kNm	11	13	11	11
Footing option 1 (Fig. 1 and 2)	Driven post			
Minimum depth of the post $\geq 1.5\text{m}$	Tests on site recommended*			
Footing option 2 (Fig. 3)	Post embedded in 300 mm diameter concrete pier**			
Minimum depth of the pier (m)	1.70	1.90	1.80	1.80

Max Frame Spacing and Footing Options of Panel Dimensions 2m x 1m

	Wind Region, tilt			
	Region A, 30° tilt	Region B, 30° tilt	Region C, 20° tilt	Region D, 20° tilt
Wind speed (m/s)	43	52	64	80
Clearance calculated, m	0.64	0.64	0.98	0.98
Maximum spacing* (m)	1.85	1.25	1.50	0.95
Max Vertical Reaction Downward, kN	9	9	12	12
Max Vertical Uplift Reaction, kN	9	9	11	11
Max Horizontal Reaction, kN	6	6	5	5
Max Moment at GL, kNm	13	13	13	13
Footing option 1 (Fig. 1 and 2)	Driven post			
Minimum depth of the post $\geq 1.5\text{m}$	Tests on site recommended*			
Footing option 2 (Fig. 3)	Post embedded in 300 mm diameter concrete pier**			
Minimum depth of the pier (m)	1.70	1.70	1.60	1.60

Notes

*The maximum frame spacing is based on the structural capacity of the frame in the edge (perimeter zone of array). We recommend to perform tests on site for the geotechnical capacity of the driven post. The spacing may need to be decreased to achieve the available geotechnical capacity of the driven post following from the test results.

**Footing option 2 recommended for 'Firm' soils with allowable end bearing capacity of 100 kPa (damp clays, sandy clays, damp sands). Other piers sizes are possible. Contact Clenergy for site specific conditions.

*For SolarTerrace II-A driven post installation, maximum post height above ground is 1.3m.

*For SolarTerrace II-A concrete pier installation, maximum post height above ground 1.5m.

4. Installation instructions

1. C-Post installation

1a. Before starting, check you have the installation tools needed. Position the required components close to the installation location. Make sure that the hydraulic pile driver equipment is suitable for your particular installation.

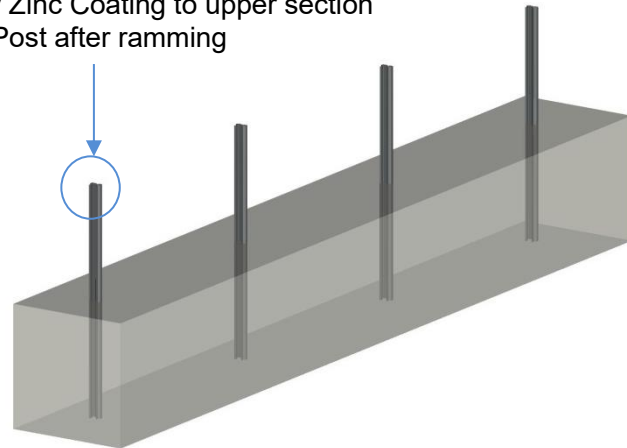
Mark the line of the post array.
1b. Obtain the maximum allowed distance between posts and the minimum embedment length from the relevant engineering certificate and/or project drawing. If you don't have this document, please contact the Clenergy customer service.

Mark the positions of the posts (you can use a string and a tape measure or a GPS) and drive the posts into the ground. Make sure all posts are in line and set to the correct height according to the drawing (you can use a string or a laser tool).

Note: apply zinc coating to upper section of C-Post after piling. The reason for that is that ramming can damage the galvanisation of the posts.



Apply Zinc Coating to upper section of C Post after ramming



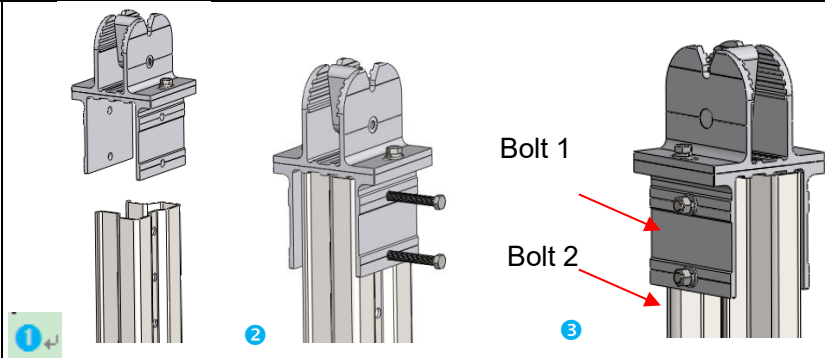
2. Post head installation

Install the post head and fix it with the two M12 bolts and nuts supplied. To avoid stainless steel galling/seizing apply grease or lubricant if needed.

Recommended torques:

Bolt 1: 55 Nm

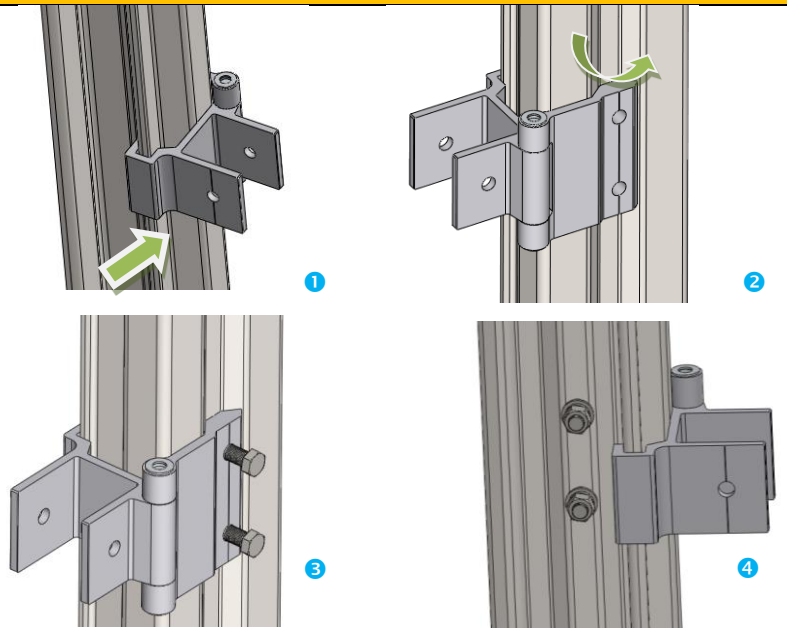
Bolt 2: 23 Nm



3. Post brace installation

3a.
Click the Post brace into C-Post as shown and connect with the two M12 bolts and nuts supplied.

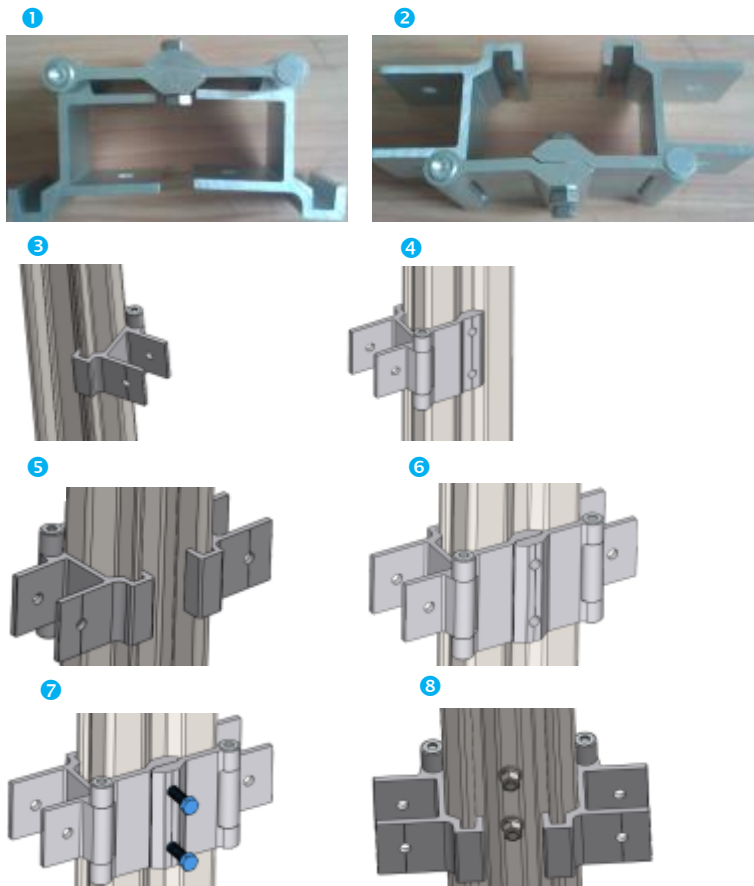
Recommended torque:
55 Nm



3a. Post brace on double support installation.

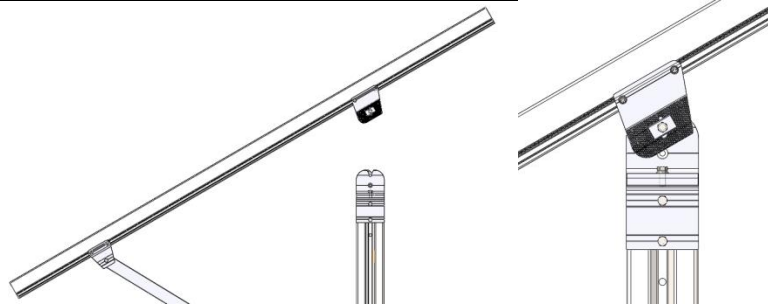
Click two post braces into C-Post as shown and connect with the two M12 bolts and nuts supplied.

Recommended torque:
55 Nm



4. Pre-assembled support installation

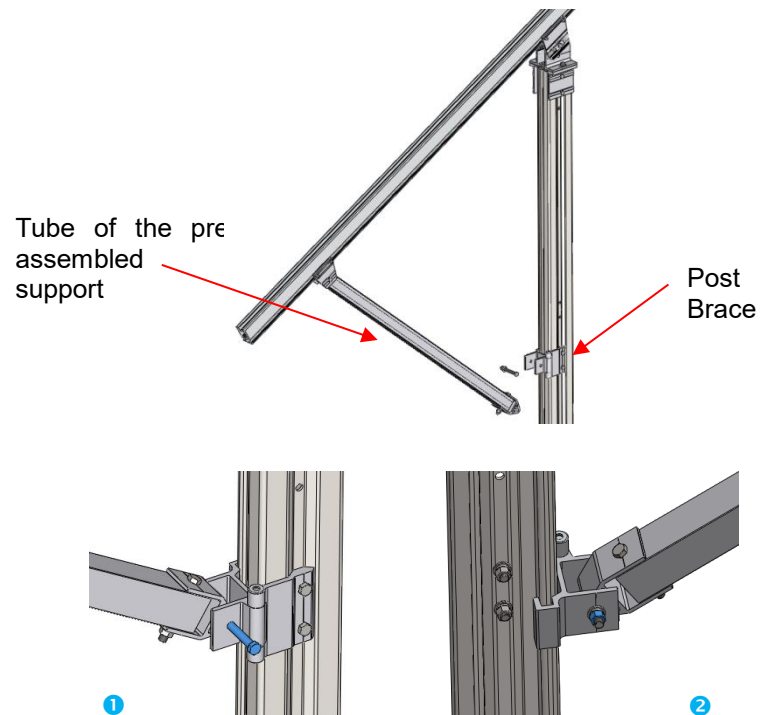
Place the (pre-assembled) support into post head as shown.



- Connect the brace to the post using the M12 bolt and nut supplied.

Recommended torque:

55 Nm



Double support installation

Place the double support (pre-assembled) into post head. Connect the tubes of the support to the post braces on the post using the M12 bolt and nut supplied

Recommended torque:

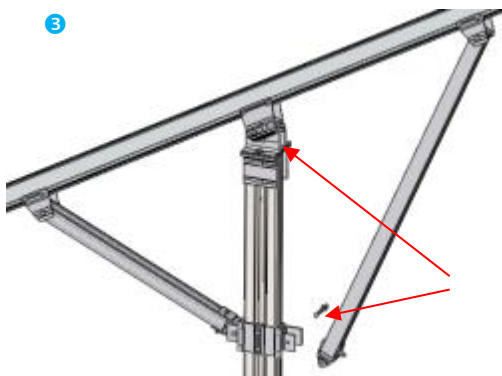
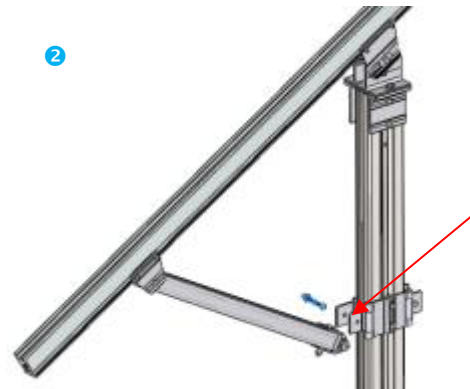
55 Nm

Note: The lengths of the two tubes are different. Make sure the shorter one is positioned at the lower part of the tilt as shown.

②. Connect the shorter Tube Support to post brace.

③. Adjust the bolt position of T head in order to prevent the hole of the post brace can't align to the hole of Tube Support

④. Rotation the orientation of T head to in order to prevent the Tube Support can't fit the post brace quite well.



5. System adjusting.

Please adjust Racking System finally.
Adjust vertically: Loosen Bolt 1 and slide along ellipse hole.

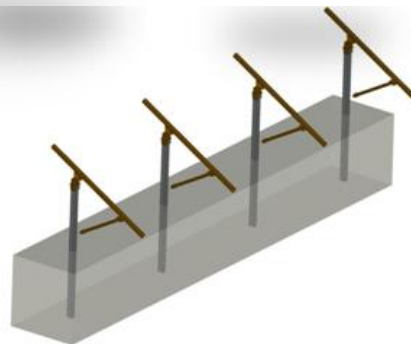
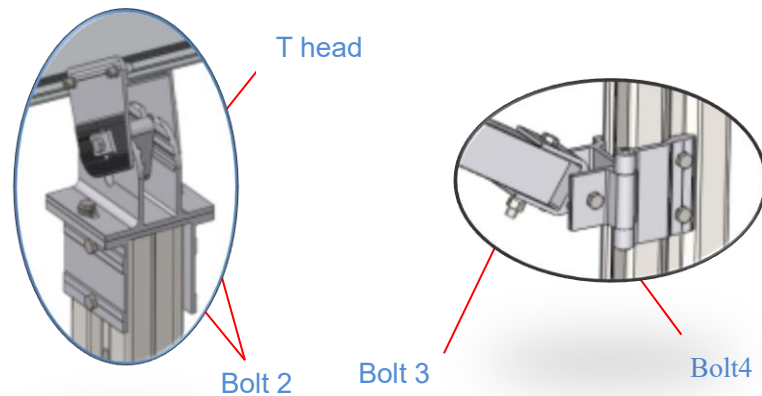
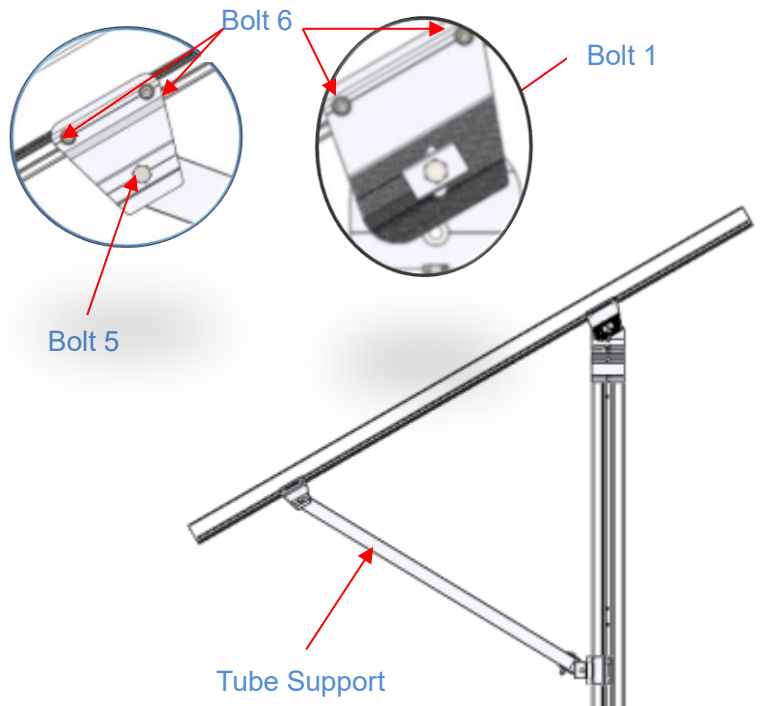
Adjust Tri-groove beam parallel: Loosen Bolt 2 and Bolt 3, turn Post Head slightly, move AI Tube left and right until being parallel. Keep all of Tri-groove beams parallel at same level.

Note:

Make sure all of Tri-groove beams in a line prior to installation of T-Rails.

Check the torque value of bolt:

- Bolt 1:55 Nm
- Bolt 2:55 Nm
- Bolt 3:40 Nm
- Bolt 4:55 Nm
- Bolt 5:40 Nm
- Bolt 6:20 Nm

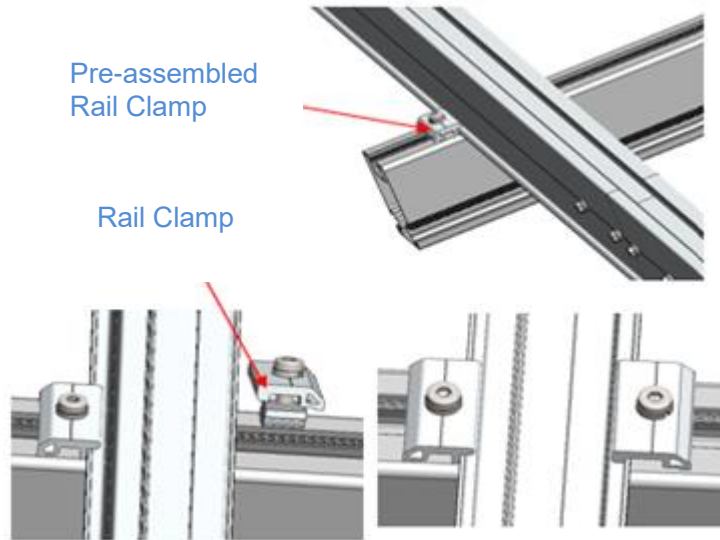


6. T-Rail Installation

6a. Slide T-Rails into Pre-assembled rail clamp on Tri-groove beams and use the 6mm Allen (Hex) to fasten on another side via Rail Clamp for T-Rail.

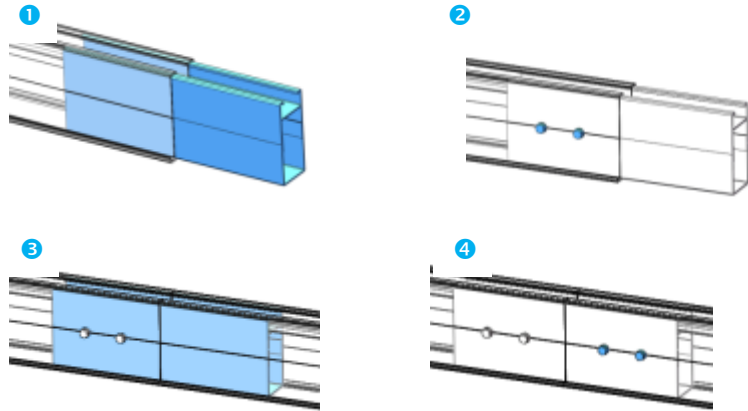
Recommended Torque:
M8:18Nm

Note: Rail clamps can work both sides with no pre-assembled rail clamp.



6b. Please determine the necessary length of T-Rail prior to installation, if T-Rail isn't long enough; please joint two rails via Rail splice as shown before installing the T-Rail as directed in step 6a.

Note:
Connecting Rails on Structure system are not recommended.



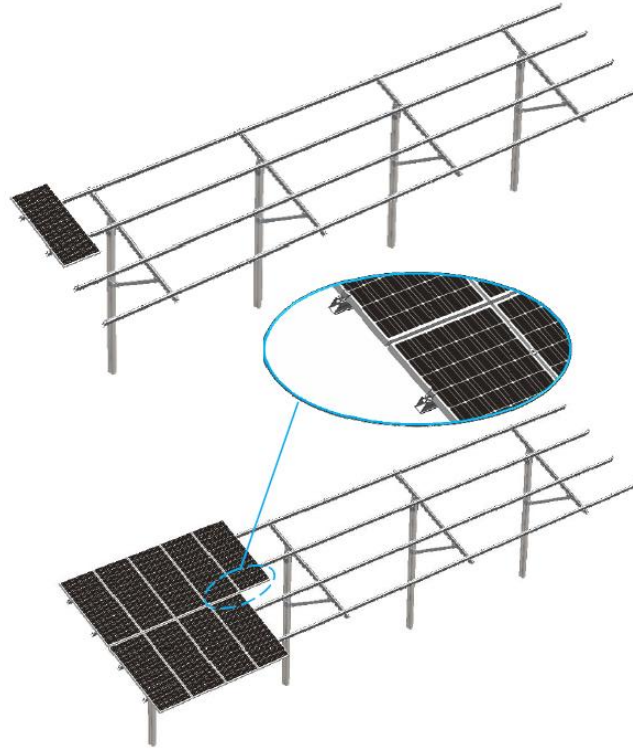
6c. Now the Racking System is completed.



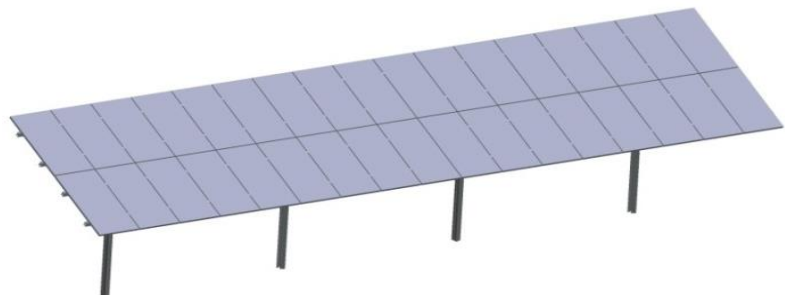
7. PV Modules Installation

7a. Fix PV panel to T-Rail 110 via Inter Clamps and End clamps. Maintain 20mm vertical gap and 20mm horizontal gap between the two rows.
 Use the 6mm Allen (Hex) to tighten the bolts of the end clamps.
 Tip: Use Inter Clamp U18 as the gap location.

Recommended Torque:
 M8:20Nm



7b. The installation is complete.



5. Notices and Safety Precautions

5.1 Notices during Stainless Steel Fasteners Installation:

Improper operation may lead to deadlock of Bolts and Screws

1. Reduce the friction coefficient:

- (1) Ensure that the thread surface is clean (no dirt or contaminant)
- (2) Apply lubricant(grease or 40# engine oil) to fasteners prior tightening to avoid galling or seizing in the threads;

2. General installation instructions:

- (1) Apply force to fasteners in the direction of thread;
- (2) Apply force uniformly, to maintain required torque;
- (3) Professional tools and tool belts are recommended;
- (4) Avoid working at high temperatures,
- (5) Avoid using electric tools for final tightening;

3. Safe Torques

Please refer to safe torques defined in this guide; for the project over MW, recommend a low speed torque when a power tool is used.

If deadlock occurs and you need to cut fasteners please make sure that there is no load on the fasteners before you cut it. Avoid damaging the anodized or galvanized surfaces

This should be applied for every stainless steel nut and bolt assembly.

5.2 Installation Dimensions

All drawings and dimensions in this installation guide are for a generic reference. The Clenergy STII-A is to be optimized to site specific conditions for each project and documented in a construction drawing. As a result, major components of the Clenergy STII-A may be provided in section sizes and lengths that vary from those shown in this guide. The installation process detailed in this instruction guide remains the same regardless of the component size. In case you need to do any on-site modifications or alteration of the system in the way that it would be different from the construction drawing please provide marked up drawings/sketches for Clenergy's review prior modification for comment and approval.

6. Project Case

1.



2.



3.



4.



5.



7. Warranty

10 year limited Product Warranty, 5 year limited Finish Warranty

Clenergy co. Ltd warrants to the original purchaser ("Purchaser") of product(s) that it manufactures ("Product") at the original installation site that the Product shall be free from defects in material and workmanship for a period of ten (10) years, except for the anodized finish, which finish shall be free from visible peeling, or cracking or chalking under normal atmospheric conditions for a period of five (5) years, from the earlier of 1) the date the installation of the Product is completed, or 2) 30 days after the purchase of the Product by the original Purchaser ("Finish Warranty").

The Finish Warranty does not apply to any foreign residue deposited on the finish. All installations in corrosive atmospheric conditions are excluded. The Finish Warranty is VOID if the practices specified by AAMA 609 & 610-02 – "Cleaning and Maintenance for Architecturally Finished Aluminum" (www.aamanet.org) are not followed by Purchaser. This Warranty does not cover damage to the Product that occurs during its shipment, storage, or installation.

This Warranty shall be VOID if installation of the Product is not performed in accordance with Clenergy's written installation instructions, or if the Product has been modified, repaired, or reworked in a manner not previously authorized by Clenergy IN WRITING, or if the Product is installed in an environment for which it was not designed. Clenergy shall not be liable for consequential, contingent or incidental damages arising out of the use of the Product by Purchaser under any circumstances. If within the specified Warranty periods the Product shall be reasonably proven to be defective, then Clenergy shall repair or replace the defective Product, or any part thereof, in Clenergy's sole discretion. Such repair or replacement shall completely satisfy and discharge all of Clenergy's liability with respect to this limited Warranty. Under no circumstances shall Clenergy be liable for special, indirect or consequential damages arising out of or related to use by Purchaser of the Product.

Manufacturers of related items, such as PV modules and flashings, may provide written warranties of their own. Clenergy's limited Warranty covers only its Product, and not any related items.